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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,620	09/24/2003	Daniel B. Roitman	10030589-1	5622

7590 04/17/2008

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EXAMINER	
JUNG, UNSU	

ART UNIT	PAPER NUMBER
1641	

MAIL DATE	DELIVERY MODE
04/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/669,620	ROITMAN ET AL.	
	Examiner	Art Unit	
	Unsu Jung	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19 and 29* is/are pending in the application.

4a) Of the above claim(s) *5,15 and 19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-14,16-18 and 29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. As a preliminary matter, a typo is noted in the Restriction requirement dated December 26, 2007, which indicated claims 1-18 and 29 directed to the List I of species. Claims directed to the List I of species should be corrected to 1-4, 6-14, 16-18, and 29 as claims 5, 15, and 19 have been previously withdrawn from consideration.

2. Applicant's election of species D (tellurium-containing films, claims 1-4, 6-14, 16-18, and 29) in the reply filed on January 28, 2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

3. Claims 1-19 and 29 are pending, claims 5, 15, and 19 are withdrawn from consideration, and claims 1-4, 6-14, 16-18, and 29 are under consideration for patentability under 37 CFR 1.104.

Rejections Withdrawn

4. The rejection of claims 1-4, 6-14, and 16-18 under 35 U.S.C. 112, second paragraph has been withdrawn in view of amended claim 1 in the reply filed on June 11, 2007.

5. The following rejections have been withdrawn in view of amended claims 1 and 29 in the reply filed on June 11, 2007:

- Rejection of claims 1, 2, 3, 7, 17, 18, and 29 under 35 U.S.C. 102(a) and 102(e) as being anticipated by Ravkin et al. (U.S. Patent No. 6,908,737, Published on Jan. 9, 2003 and Filed on Oct. 19, 2000);
- Rejection of claims 4 and 6 under 35 U.S.C. 102(a) and 102(e) as being anticipated by Ravkin et al. (U.S. Patent No. 6,908,737, Published on Jan. 9, 2003 and Filed on Oct. 19, 2000) in light of Kolesar, Jr. et al. (U.S. Patent No. 4,906,440, Mar. 6, 1990); and
- Rejection of claims 8-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. (U.S. Patent No. 6,908,737, Published on Jan. 9, 2003 and Filed on Oct. 19, 2000) in view of Tompkin et al. (U.S. Patent No. 5,754,520, May 19, 1998).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 2, 3, 7, 17, 18, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. (U.S. Patent No. 6,908,737, Published on Jan. 9, 2003 and Filed on Oct. 19, 2000) in view of Henrichs (U.S. PG Pub. No. US 2003/0161245 A1, filed July 23, 2001).

Ravkin et al. teaches a microbead particle system for bioassay comprising:

- at least one microparticle made of polymeric material (column 23, lines 42-45);
- a pattern encoded on at least one portion of said at least one microbead particle (column 20, lines 49-67);, wherein the pattern is physically marked into a digital data layer of the microbead particle to reveal or block a reflective, photoluminescent or absorbing pattern (spatial coding), wherein the digital data layer cooperates with a transducing layer (carrier material) of the microbead particle to produce a detectable signal (column 10, line 1-65).
- a selected geometry effectively associated with said at least one microbead particle, said selected geometry capable, alone or with other artifacts, of identifying at least microbead particle (column 20, lines 49-67); and
- wherein the microbead particle is suitable for chemical conjugation with ligands (column 22, lines 46-67).

With respect to claim 2, Ravkin et al. teaches a microbead particle system, wherein the said polymeric material is polymethylacrylates (thermoplastic, column 11, lines 12-25) and organosilicon resins (column 15, lines 22-30).

With respect to claim 7, Ravkin et al. teaches a microbead particle system, wherein the pattern is symmetrical (Fig. 10B).

With respect to claim 17, Ravkin et al. teaches that teaches a microbead particle system, further comprising a first embossed polymeric material having a first inner

surface opposing a first patterned surface and a second embossed polymeric material having a second inner surface opposing a second patterned surface, wherein the first inner surface forms a bond with the second inner surface (column 10, lines 61-65 and Fig. 14).

With respect to claim 18, Ravkin et al. teaches a microbead particle system, further comprising means for marking said at least one microbead particle after binding with an analyte, said at least one microbead particle being identified by the emission of dyes or luminescent molecules associated with the analyte (column 27, lines 3-11).

However, Ravkin et al. fails to teach a microbead particle system, wherein the transducing layer is tellurium-containing films and the transducing layer produces a detectable binary data.

Henrichs teaches binary data comprising tellurium data-recording material layer (tellurium-containing films, see entire document, p48, particularly [0519]). An optical phase-change material is capable of being switched from one detectable state to another detectable state or states by the application of optical energy (p49, paragraph [0527]). The state of the phase-change material is detectable by properties such as, for example, index of refraction, optical absorption, optical reflectivity, or any combination thereof (p49, paragraph [0527]). Tellurium based materials have been utilized as phase-change media for data storage, where the change is evidenced by a change in a physical property such as reflectivity (p49, paragraph [0527]).

Therefore, one of ordinary skill in the art at the time of the invention would have been motivated to employ the binary coding method of Henrichs, which includes use of

tellurium-containing films, in the microbead particle system of Ravkin et al. with a reasonable expectation of success since the method using tellurium-containing film for storing information in binary code format is well known in the coding arts and Ravkin et al. teaches that coding material on microbead particle system may be made in a wide array of colors, optical characteristics, and combinations of colors and optical characteristics (column 10, lines 7-9). In addition, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to select an appropriate coding scheme including the transducing layer comprising tellurium-containing films, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). See MPEP § 2144.07. Because the claimed system is known in the prior art and has been disclosed to include a wide array of colors, optical characteristics, and combinations of colors and optical characteristics for encoding transducing layer of microbead particle system in general, the selection of a specific type of encoding scheme in itself does not present a novel feature of the claimed invention. Since one of ordinary skill in the art at the time of the invention would recognize that the system of Ravkin et al. can employ be a wide array of colors, optical characteristics, and combinations of colors and optical characteristics for encoding transducing layer of microbead particle system for variety of coding schemes, it would have been obvious to apply binary coding method of Henrichs, which includes use of tellurium-containing film,

in the microbead particle system of Ravkin et al. with a reasonable expectation of success.

According to the current specification (p5), the microbead particle of claim 1 formed by the method recited in claim 29. MPEP states that the lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).Ravkin et al. teaches a microbead particle system for bioassay as discussed above. However, Ravkin et al. fails to teach a microbead particle system, wherein the pattern encoded on at least one portion of the microbead particle generates a diffractive image.

10. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. (U.S. Patent No. 6,908,737, Published on Jan. 9, 2003 and Filed on Oct. 19, 2000) in view of Henrichs (U.S. PG Pub. No. US 2003/0161245 A1, filed July 23,

2001) as applied to claim 1 above, and further evidenced by .Kolesar, Jr. et al. (U.S. Patent No. 4,906,440, Mar. 6, 1990).

Ravkin et al. in view of Henrichs teaches a microbead particle system for bioassay as discussed above. Further, Ravkin et al. teaches a microbead particle system further comprising at least one layer of material, silicon nitride (column 15, lines 33-38) on polymeric material. With respect to claim 6, Ravkin et al. teaches a microbead particle system, wherein said at least one layer of material includes at least one surface suitable for chemical conjugation with a ligand (column 22, lines 46-67).

Although Ravkin et al. in view of Henrichs is silent on disclosing that the silicon nitride is a dielectric material, one of ordinary skill in the art at the time of the invention would have recognized that the silicon nitride is a dielectric material as evidenced by Kolesar, Jr. et al. (column 8, line 8).

11. Claims 8-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. (U.S. Patent No. 6,908,737, Published on Jan. 9, 2003 and Filed on Oct. 19, 2000) in view of Henrichs (U.S. PG Pub. No. US 2003/0161245 A1, filed July 23, 2001) as applied to claims 1 and 7, and further in view of Tompkin et al. (U.S. Patent No. 5,754,520, May 19, 1998).

Ravkin et al. in view of Henrichs teaches a microparticle system for bioassay as set forth above.

With respect to claim 13, Ravkin et al. teaches a pre-selected geometry associated with the microbead particle (column 20, lines 35-40). With respect to the

recitation of "wherein the said geometry enables seating in a receiving substrate in a manner effective for particle identification", enabling seating in a receiving substrate in a manner effective for particle identification is an inherent property of the pre-selected geometry associated with the microbead particle.

With respect to claim 14, Ravkin et al. teaches that the pre-selected surface shape and size is triangles, circles, or squares (column 5, lines 49-56), wherein said pre-selected surface shape is used in combination with color dyes (column 9, lines 43-44). With respect to the recitation of "said treatment creating an interferometric or holographic color pattern", creating an interferometric or holographic color pattern is an inherent property of said pre-selected surface shape with color dye treatment.

However, Ravkin et al. in view of Henrichs fails to teach a microbead particle system, wherein the pattern encoded on at least one portion of the microbead particle generates a diffractive image.

Tompkin et al. teaches a method of using diffraction grating patterns as optical data carriers (Abstract). In the simplest case, the diffraction pattern is a diffraction grating with a symmetrical or asymmetrical profile shape, which diffracts light predominantly in two or single direction, respectively (column 12, lines 1-4). Diffraction pattern of one profile shape (one unit cell) can represent value "1" and the other (second unit cell) can represent "0" so that information can be stored in multiple number of unit cells, which represents a plurality of bits (column 12, lines 1-40).

With respect to the recitation of claims 8-10, "wherein said pattern is capable of generating a diffractive image", generating a diffractive image is an inherent property of diffraction grating patterns of Tompkin et al. upon illumination.

With respect to claim 9, Tompkin et al. teaches a diffraction grating pattern comprising at least one unit cell, which is being repeated (column 12, lines 1-40).

With respect to claim 11, Tompkin et al. teaches a diffraction grating pattern comprising plurality of regions (unit cell), which is capable of producing a plurality of electromagnetic responses.

With respect to the recitation of claims 11 and 12 "wherein said pattern is capable of producing a plurality of electromagnetic responses, wherein the plurality of electromagnetic responses is selected from the group consisting of reflectivity, light absorption, and photoluminescence", producing a plurality of electromagnetic responses such as reflectivity, light absorption, and photoluminescence is an inherent property of diffraction grating patterns of Tompkin et al. upon illumination an electromagnetic source.

With respect to claim 16, Tompkin et al. teaches that the pattern represents ridges and troughs (Fig. 5) corresponding to constructive and destructive interference patterns. With respect to the recitation of "a relationship between said ridges and troughs being a function of refractive index of said polymeric material, refractive index of a medium through which the depth of said pattern is measured, and the wavelength of light impinging on said pattern", the ridges and troughs being a function of refractive index of said polymeric material, refractive index of a medium through which the depth of said pattern is measured, and the wavelength of light impinging on said pattern is an inherent property of the polymeric material of the microbead particle having patterns of ridges and troughs.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the optical coding method of Tompkin et al., which comprises use of symmetrical and asymmetrical diffraction grating patterns that are capable of generating diffractive images, in the microbead particle system of Ravkin et al. in view of Henrichs in order to use binary code to encode the microbead particle

system. Combining diffraction grating coding method of Tompkin et al. with the coding methods of Ravkin et al. in view of Henrichs is advantageous as additional coding method would provide increased repertoire of different types of codes to distinguish the microbead particle system of Ravkin et al. in view of Henrichs with a reasonable expectation of success as the methods of generating and reading diffraction grating pattern is done on polymeric surface is well known in the art of optical coding applications.

Response to Arguments

12. Applicant's arguments with respect to claims 1-4, 6-14, 16-18, and 29 have been considered but are moot in view of the new ground(s) of rejection.

13. Since the prior art fulfills all the limitations currently recited in the claims, the invention as currently recited would read upon the prior art.

Conclusion

14. No claim is allowed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Unsu Jung whose telephone number is (571)272-8506. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Unsu Jung/
Unsu Jung, Ph.D.
Patent Examiner, Art Unit 1641